## Rule WLM661: Asynchronous service time was high for the indicated structure

**Finding:** The asynchronous service time for the indicated structure exceeded the guidance provided to CPExpert.

**Impact:** This finding can have a LOW IMPACT, MEDIUM IMPACT, or HIGH IMPACT on the signalling performance of the sysplex. The level of impact depends on the amount of delay to asynchronous requests and how important the requests are.

**Logic flow:** This a basic finding. There are no predecessor rules.

**Discussion:** Signalling requests to a coupling facility can occur only if a subchannel to the coupling facility is available. If no subchannel is available, the cross-system extended services (XES) will either enter a CPU "spin loop" waiting for a subchannel to become available or queue the request until a subchannel is available. The type of action taken by XES depends on whether the request was specified as synchronous or asynchronous.

- Synchronous requests require that a response be received from the coupling facility before the requesting application continues execution. Synchronous requests would be used, for example, to request a lock. In this example, the application cannot proceed until the lock is granted.

  For synchronous requests, XES will either (1) satisfy the request if a subchannel is available, (2) enter CPU "spin-looping" until a subchannel is available and the request is satisfied, or (3) convert the synchronous request to an asynchronous request if the type of request permits the conversion.

- Asynchronous requests allow the requesting application to continue processing and be notified when the request is completed. For asynchronous requests, XES either starts or queues the request and returns control to the application issuing the request.

  The type (synchronous or asynchronous) of request that is issued generally depends on the type of structure.

- Some requests can be satisfied only by synchronous requests (for example, signals generated by XES itself will always be synchronous and will not be converted to asynchronous requests).

**Rule WLM661**.1

- Some requests can be issued as either synchronous or asynchronous requests, depending on the application's use of the structure (for example, cache structure requests can be issued as either synchronous or asynchronous).

- Some requests are issued as asynchronous requests (for example, JES2 requests to the JES2 checkpoint will be issued as asynchronous requests).

- Some requests can be issued as synchronous but will be converted to asynchronous if the subchannels are busy[1] unless the application has indicated that the synchronous cannot be converted.

The time spent waiting for subchannels to become free for asynchronous requests delays the request (and consequently delays the application waiting on the request).

The service time represents the time from when MVS issues a command for the coupling facility until the return from the command is recognized by MVS. The time includes time spent on the coupling facility links, the coupling facility processing time, any delay time while the request is queued, and the time for MVS to recognize that the command was completed. The service time varies based on whether subchannels are available, the activity level of the coupling facility itself, and on the amount of data being processed.

IBM suggests that the service time for asynchronous requests should be less than 5000 microseconds.

CPExpert compares the asynchronous service time (R744ASTM) against the **ASYNCSRV** variable in USOURCE(WLMGUIDE). CPExpert produces Rule WLM661 when the asynchronous service time is greater than the ASYNCSRV guidance variable.

The default value for the ASYNCSRV variable is 5000, indicating that CPExpert should produce Rule WLM661 when asynchronous service time is more than 5000 microseconds.

The following example illustrates the output from Rule WLM661:

---

[1]The application can specify which requests must be satisfied as synchronous and which can be converted to asynchronous. XES will automatically convert requests from synchronous to asynchronous if all signalling paths are busy, unless the application specifies that the conversion is not to be done.

```
RULE WLM661: SERVICE TIME WAS HIGH FOR ASYNCHRONOUS REQUESTS

  DB2DBP2_GBP2:  The service time for this structure has exceeded the
  guidelines for asynchronous requests.  Service time is accumulated from
  the time MVS issues a command for the coupling facility until the return
  from the command is recognized by MVS.  Service time is recorded for
  each structure used by each system.  You can alter the times used by
  CPExpert in making this finding by altering the ASYNCSRV guidance
  variables in USOURCE(WLMGUIDE) if you are unable to make changes to
  reduce service time for the structure.

                              TOTAL  ASYNC       AVERAGE SERVICE
  MEASUREMENT INTERVAL          REQUESTS        TIME (MILLISECONDS)
  12:45-13:00,02OCT1996           154                 5.91
  13:00-13:15,02OCT1996            95                 7.11
  14:00-14:15,02OCT1996           156                 5.52
  15:45-16:00,02OCT1996            53                 6.04
  16:45-17:00,02OCT1996           167                 5.57
```

**Suggestion**: CPExpert suggests that you consider the following alternatives if Rule WLM661 is produced:

- Asynchronous command processing is performed primarily by the I/O processor.  You should make certain that sufficient CPU resources have been allocated to the coupling facility LPAR.

- Examine whether the structure activity is balanced between coupling facilities.  You may wish to consider redistributing the structures among the coupling facilities if a significant imbalance exists.

- You should consider whether additional coupling facility links should be added between the MVS processor the coupling facility.  Each coupling facility link will contribute two subchannels.

- If possible, you should consider influencing the exploiters of the coupling facilities to lower the activity rate to the coupling facilities.  Taking other tuning actions (especially if indicated by other rules produced by CPExpert) may reduce the number of XCF signals.  For example, signal activity can be lowered by (1) reducing lock contention, (2) reducing false lock contention, or (3) tuning the XCF to eliminate signals related to the expansion of a transport class size.

If none of the above alternatives are appealing, you may wish to change the guidance to CPExpert by altering the **ASYNCSRV** guidance variable in USOURCE(WLMGUIDE).

**Reference**: Washington System Center Flash 9609 ("CF Reporting Enhancements to RMF 5.1")

"Parallel Sysplex Performance: tuning tips and techniques,"
Kelley, Joan (IBM, Poughkeepsie, NY), SHARE 86, February 1996.

**Rule WLM661**.4